ADB
Airfield Solutions

Instruction Manual

Windsock Tower

Internally Illuminated - LED or Quartz

96A0433, Rev. F, 12/1/15

A.0 Disclaimer / Standard Warranty

A.1 CE certification

The equipment listed as CE certified means that the product complies with the essential requirements concerning safety and hygiene. The directives that have been taken into consideration in the design are available on written request to ADB.

A.2 ETL certification

The equipment listed as ETL certified means that the product complies with the essential requirements concerning safety and FAA Airfield regulations. The directives that have been taken into consideration in the design are available on written request to ADB.

A.3 LED Product Guarantee

Where applicable, per FAA EB67(applicable edition), ADB L858(L) Airfield Guidance Signs are warranted against electrical defects in design or manufacture of the LED or LED specific circuitry for a period of 4 years. ADB LED light fixtures (with the exception of obstruction lighting) are warranted against mechanical and physical defects in design or manufacture for a period of 12 months from date of installation; and are warranted against electrical defects in design or manufacture of the LED or LED specific circuitry for a period of 4 years per FAA EB67 (applicable edition).

NOTE: See your sales order contract for a complete warranty description. In some specific cases, deviations are (to be) accepted in the contract, which will supersede the standard warranty.

A.4 Standard Product Guarantee

Products of ADB manufacture are guaranteed against mechanical, electrical, and physical defects (excluding lamps) which may occur during proper and normal use for a period of one year from the date of installation or 2 years from date of shipment and are guaranteed to be merchantable and fit for the ordinary purposes for which such products are made. ADB L858 Airfield Guidance Signs are warranted against mechanical and physical defects in design or manufacture for a period of 2 years from date of installation per FAA AC 150/5345-44 (applicable edition).

NOTE: See your sales order contract for a complete warranty description.

A.5 All Products

LED Products of ADB, manufactured and sold by ADB or its licensed representatives, meets the corresponding requirements of FAA, ICAO and IEC.

ADB will correct by repair or replacement per the applicable guarantee above, at its option, equipment or parts which fail because of mechanical, electrical or physical defects, provided that the goods have been properly handled and stored prior to installation, properly installed and properly operated after installation, and provided further that Buyer gives ADB Airfield Solutions written notice of such defects after delivery of the goods to Buyer. Refer to the Safety section for more information on Material Handling Precautions and Storage precautions that must be followed.

ADB reserves the right to examine goods upon which a claim is made. Said goods must be presented in the same condition as when the defect therein was discovered. ADB Airfield Solutions furthers reserves the right to require the return of such goods to establish any claim.

ADB's obligation under this guarantee is limited to making repair or replacement within a reasonable time after receipt of such written notice and does not include any other costs such as the cost of removal of defective part, installation of repaired product, labor or consequential damages of any kind, the exclusive remedy being to require such new parts to be furnished.

ADB's liability under no circumstances will exceed the contract price of goods claimed to be defective. Any returns under this guarantee are to be on a transportation charges prepaid basis. For products not manufactured by, but sold by ADB Airfield Solutions, warranty is limited to that extended by the original manufacturer.

This is ADB's sole guarantee and warranty with respect to the goods; there are no express warranties or warranties of fitness for any particular purpose or any implied warranties of fitness for any particular purpose or any implied warranties other than those made expressly herein. All such warranties being expressly disclaimed.

A.6 Liability

WARNING

Use of the equipment in ways other than described in the catalogue leaflet and the manual may result in personal injury, death, or property and equipment damage. Use this equipment only as described in the manual.

ADB cannot be held responsible for injuries or damages resulting from non-standard, unintended uses of its equipment. The equipment is designed and intended only for the purpose described in the manual. Uses not described in the manual are considered unintended uses and may result in serious personal injury, death or property damage.

Unintended uses includes the following actions:

- Making changes to equipment that have not been recommended or described in this manual or using parts that are not genuine ADB replacement parts or accessories.
- Failing to make sure that auxiliary equipment complies with approval agency requirements, local codes, and all applicable safety standards if not in contradiction with the general rules.
- Using materials or auxiliary equipment that are inappropriate or incompatible with your ADB equipment.
- Allowing unskilled personnel to perform any task on or with the equipment.

A.7 © ADB BVBA

This manual could contain technical inaccuracies or typographical errors. ADB BVBA reserves the right to revise this manual from time to time in the contents thereof without obligation of ADB BVBA to notify any person of such revision or change. Details and values given in this manual are average values and have been compiled with care. They are not binding, however, and ADB BVBA disclaims any liability for damages or detriments suffered as a result of reliance on the information given herein or the use of products, processes or equipment to which this manual refers. No warranty is made that the use of the information or of the products, processes or equipment to which this manual refers will not infringe any third party's patents or rights. The information given does not release the buyer from making their own experiments and tests.

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1.0 Safety

This section contains general safety instructions for installing and using ADB Airfield Solutions equipment. Some safety instructions may not apply to the equipment in this manual. Task- and equipment-specific warnings are included in other sections of this manual where appropriate.

1.1 HAZARD Icons used in the manual

For all HAZARD symbols in use, see the Safety section. All symbols must comply with ISO and ANSI standards.

Carefully read and observe all safety instructions in this manual, which alert you to safety hazards and conditions that may result in personal injury, death or property and equipment damage and are accompanied by the symbol shown below.

	**WARNING** • Failure to observe a warning may result in personal injury, death or equipment damage.
	**DANGER - RISK OF ELECTRICAL SHOCK OR ARC FLASH** • Disconnect equipment from line voltage. Failure to observe this warning may result in personal injury, death, or equipment damage. ARC Flash may cause blindness, severe burns or death.
	**WARNING - WEAR PERSONAL PROTECTIVE EQUIPMENT** • Failure to observe may result in serious injury.
	**WARNING - DO NOT TOUCH** • Failure to observe this warning may result in personal injury, death, or equipment damage.
	**CAUTION** • Failure to observe a caution may result in equipment damage.

1.1.1 Qualified Personnel

IMPORTANT INFORMATION

The term **qualified personnel** is defined here as individuals who thoroughly understand the equipment and its safe operation, maintenance and repair. Qualified personnel are physically capable of performing the required tasks, familiar with all relevant safety rules and regulations and have been trained to safely install, operate, maintain and repair the equipment. It is the responsibility of the company operating this equipment to ensure that its personnel meet these requirements.

Always use required personal protective equipment (PPE) and follow safe electrical work practices.

1.2 To use this equipment safely:

WARNING

Read installation instructions in their entirety before starting installation.

- Become familiar with the general safety instructions in this section of the manual before installing, operating, maintaining or repairing this equipment.
- Read and carefully follow the instructions throughout this manual for performing specific tasks and working with specific equipment.
- Make this manual available to personnel installing, operating, maintaining or repairing this equipment.
- Follow all applicable safety procedures required by your company, industry standards and government or other regulatory agencies.
- Install all electrical connections to local code.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current demand. All wiring must meet local codes.
- Route electrical wiring along a protected path. Make sure they will not be damaged by moving equipment.
- Protect components from damage, wear, and harsh environment conditions.
- Allow ample room for maintenance, panel accessibility, and cover removal.
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning prior to returning power to the circuit.

Failure to follow these warnings may result in serious injury or equipment damage.

1.2.1 Additional Reference Materials:

IMPORTANT INFORMATION

- IEC - International Standards and Conformity Assessment for all electrical, electronic and related technologies
- IEC 60364 - Electrical Installations in Buildings
- FAA Advisory: AC 150_5340_26 (current edition) Maintenance of Airport Visual Aid Facilities
- ANSI/NFPA 79, Electrical Standards for Metalworking Machine Tools.
- National and local electrical codes and standards.

1.2.2 Intended Use

WARNING

IMPROPER USE

Using this equipment in ways other than described in this manual may result in personal injury, death or property and equipment damage. Use this equipment only as described in this manual.

THESE WARNINGS MAY RESULT IN SERIOUS INJURY OR EQUIPMENT DAMAGE.

1.2.3 Fasteners

WARNING

FOREIGN OBJECT DAMAGE - FOD

- Only use fasteners of the same type as the one originally supplied with the equipment.
- Always tighten the fasteners to the recommended torque. Use a calibrated torque wrench and apply the recommended adhesive type.
- Obey the instructions of the adhesives necessary for the fasteners.

Failure to follow these warnings may cause the fasteners to loosen, damage the equipment, potentially to loosen the equipment. This can lead to a highly dangerous situation of FOD, with potential lethal consequences.

1.2.4 Operation

CAUTION

IMPROPER OPERATION

- Only qualified personnel, physically capable of operating the equipment and with no impairments in their judgment or reaction times, should operate this equipment.
- Read all system component manuals before operating this equipment. A thorough understanding of system components and their operation will help you operate the system safely and efficiently.
- Before starting this equipment, check all safety interlocks, fire-detection systems, and protective devices such as panels and covers. Make sure all devices are fully functional. Do not operate the system if these devices are not working properly. Do not deactivate or bypass automatic safety interlocks or locked-out electrical disconnects or pneumatic valves.
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning.
- Route electrical wiring along a protected path. Make sure they will not be damaged by moving equipment.
- Never operate equipment with a known malfunction.
- Do not attempt to operate or service electrical equipment if standing water is present.
- Use this equipment only in the environments for which it is rated. Do not operate this equipment in humid, flammable, or explosive environments unless it has been rated for safe operation in these environments.
- Never touch exposed electrical connections on equipment while the power is ON.

Failure to follow this instruction can result in equipment damage.

1.2.5 Storage

CAUTION

IMPROPER STORAGE

If equipment is to be stored prior to installation, it must be protected from the weather and kept free of condensation and dust.

Failure to follow this instruction can result in equipment damage.

1.2.6 Material Handling Precautions

CAUTION

ELECTROSTATIC SENSITIVE DEVICES

This equipment may contain electrostatic sensitive devices.

- Protect from electrostatic discharge.
- Electronic modules and components should be touched only when this is unavoidable e.g. soldering, replacement.
- Before touching any component of the cabinet you should bring your body to the same potential as the cabinet by touching a conductive earthed part of the cabinet.
- Electronic modules or components must not be brought in contact with highly insulating materials such as plastic sheets, synthetic fiber clothing. They must be laid down on conductive surfaces.
- The tip of the soldering iron must be grounded.
- Electronic modules and components must be stored and transported in conductive packing.

Failure to follow this instruction can result in equipment damage.

WARNING

UNSTABLE LOAD

- Use extreme care when moving heavy equipment.
- Verify that the moving equipment is rated to handle the weight.
- When removing equipment from a shipping pallet, carefully balance and secure it using a safety strap.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

1.2.7 Action in the Event of a System or Component Malfunction

DANGER

ARC FLASH AND ELECTRIC SHOCK HAZARD

- Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.
- An open airfield current circuit is capable of generating >5000 Vac and may appear OFF to a meter.
- Never unplug a device from a constant current circuit while it is operating. Arc flash may result.
- Disconnect and lock out electrical power.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component according to instructions provided in its manual.

Failure to follow these warnings will result in death or equipment damage.

1.2.8 Maintenance

WARNING

ELECTRIC SHOCK HAZARD

- Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.
- Disconnect and lock out electrical power.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component according to instructions provided in its manual.

Failure to follow these warnings will result in death or equipment damage.

1.2.9 Maintenance and Repair

DANGER

ARC FLASH AND ELECTRIC SHOCK HAZARD

Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks.

- Only persons who are properly trained and familiar with ADB Airfield Solutions equipment are permitted to service this equipment.
- An open airfield current circuit is capable of generating >5000 Vac and may appear OFF to a meter.
- Never unplug a device from a constant current circuit while it is operating. Arc flash may result.
- Disconnect and lock out electrical power.
- Always use safety devices when working on this equipment.
- Follow the recommended maintenance procedures in the product manuals.
- Do not service or adjust any equipment unless another person trained in first aid and CPR is present.
- Connect all disconnected equipment ground cables and wires after servicing equipment. Ground all conductive equipment.
- Use only approved ADB Airfield Solutions replacement parts. Using unapproved parts or making unapproved modifications to equipment may void agency approvals and create safety hazards.
- Check the interlock systems periodically to ensure their effectiveness.
- Do not attempt to service electrical equipment if standing water is present. Use caution when servicing electrical equipment in a high-humidity environment.
- Use tools with insulated handles when working with airfield electrical equipment.

Failure to follow these warnings will result in death or equipment damage.

2.0 Windsock Tower - Internally Illuminated - LED and Quartz

Description: Windsock towers are used at airports to provide pilots with a visual indication of wind direction and velocity at ground level.

2.1 About this manual

2.1.1 Introduction

The manual shows the information necessary to:

- Install
- Carry Out Maintenance
- Carry Out Troubleshooting on the Wind Direction Indicator.

2.1.2 How to work with the manual

1. Become familiar with the structure and content.
2. Carry out the actions completely and in the given sequence.

2.1.3 Record of changes

Page	Rev	Description	Date
All	B	Released Manual	10/30/91
All	D	SM911017 rev 4.0	10/30/06
All	E	Updated to new ADB format	
All	F	Updated, LED Options Added	12/30/15

2.2 Product Introduction

2.2.1 Equipment Description

Internally illuminated windsocks are discernible from a greater distance than typical externally lit windsocks - from the sky and the ground. Internal illumination eliminates stray reflected light that can distract pilots.

Counterweighted, hinged design allows for servicing of lamp and windsock by one individual without the need for ladders, winches or service vehicles.

Series powered units, in either LED or Quartz lamps, can be connected directly to the taxiway or runway circuits through a 200 W isolating transformer (sold separately) and maintain a constant brightness over the full 2.8 to 6.6 A current range. No external voltage converters are required.

Standard anchor bolt kits and frangible anchor bolt kits are separately available.

The standard windsock is 36" dia. x 12 ft long (914 mm dia. x 3.7 m long) in five alternating bands of orange and white, and includes drain grommets and a wear band. The nylon sock fabric is treated to repel water and to be resistant to rot and mildew.

2.2.2 Compliance with Standards

T/C: K305, TP 312

ICAO: Annex 14, Vol. 1 Para. 5.1.1

2.2.3 Uses

The Windsock Tower is used as a wind direction indicator at all aerodromes and heliports. Transport Canada standards require a minimum of one unit for runways up to 1200 m in length and two for runways greater than 1200 m in length.

The Windsock Tower can be internally illuminated using current or voltage power supply. Counterweighted, hinged design allows for servicing of lamp and windsock by one individual without the need for ladders or service vehicles. The nylon sock fabric is treated to be water repellent and to be resistant to rot and mildew.

When located within the runway safety area, the windsock tower mounting must be frangible.

2.2.4 Electrical Supply

SAT8911-LC - LED Internally Illuminated, 2.8-6.6A Series Powered from a 200W Isolating Transformer.

SAT8911-LV - LED Internally Illuminated, 120-277VAC Voltage Powered from a Line voltage input or a Series to voltage Power Adapter.

SAT8911-H - Quartz Internally Illuminated, 2.8-6.6A Series Powered from a 200W Isolating Transformer.

SAT8911-P - Option no longer available. Due to Government energy mandates, the production of the 120W, 120VAC PAR38 quartz lamp has been discontinued with no equivalent output lamp replacing it. Please order the SAT8911-LV version if 120VAC power input is required.

2.2.5 Operating Conditions

Temperature: -55°C to +55°C

Humidity: 0 to 100% (including conditions where condensation takes place in the form of water or frost)

Altitude: 0 to 10,000 ft (3,000 m)

Wind: Velocities up to 75 knots (140 km/hr)

Exposure: Withstands windblown rain, sand, dust particles, and a salt-laden atmosphere

2.2.6 Equipment Specification Data

Windsock tower is shipped in three pieces:

Description Dimensions Weight

Pole Section 16 ft x 20" x 3" 100 lb (4.9 m x 51 cm x 8 cm 46 kg)

Base Section 16" x 16" x 72" 110 lb (41 cm x 41 cm x 183 cm 50 kg)

Cage & Hardware 40" x 40" x 48" 90 lb (1 m x 1 m x 1.2 m 41 kg)

2.2.7 Equipment and Accessories Supplied

Windsock Tower assembly generally consists of the following:

- — Tower Base Section
- — Tower Pole Section
- — Tower Cage
- — Swivel
- — Lighting Fixture
- — Weatherproof Disconnect Switch and/or Current Power Supply
- — Misc hardware and wiring devices.

Refer to drawing Figure 13 and Table 5 for a complete listing of the components supplied with the windsock tower.

NOTE: Anchor bolt kits are ordered separately. Please refer to catalogue sheet C1017or, see Figure 2, Figure 3 and Figure 13.

2.2.8 Equipment Required But Not Supplied

a. Wrenches for 3/8", 3/4", 1" hex bolts/nuts
b. Medium size blade screwdriver
c. Sawhorse
d. Wire stripper/crimper
e. Screwdriver Set
f. Electric Drill c/w set of bits
g. Waterproof Grease
h. Wire nuts
i. Incoming Power wiring
j. Source of 120VAC,60Hz or 200W Isolating Transformer.
k. True RMS Ammeter and Voltmeters for 6.6A Series circuit model
l. 1/4"-20 Tap
m. 6 - 1/4"-20 x 1" S.S. Screws

2.3 Installation

2.3.1 Introduction

This section provides the detailed procedures required to safely and correctly install, integrate, calibrate, align, and confirm (i.e. checkout) performance of the product.

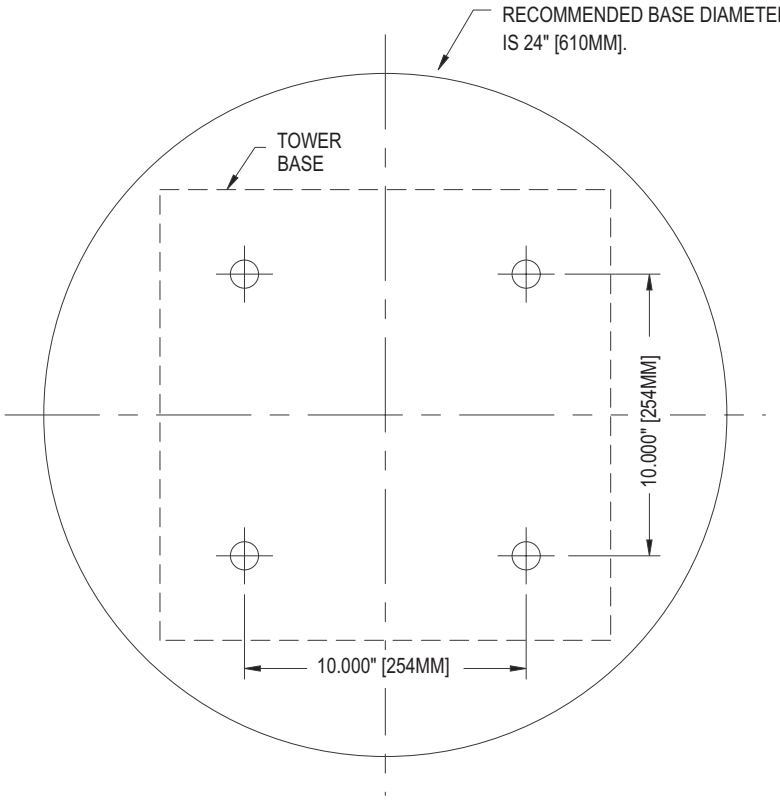
2.3.2 Unpacking and Material Inspection

Unpack all cartons upon receipt and check for contents and condition. Note any exterior carton damage that would indicate equipment damage. Be sure to check number of cartons received against the bill of lading. If damage to any equipment is noted, a claim form should be filed with the carrier immediately. Inspection of equipment by the carrier at time of delivery should be required.

2.3.3 Installation Procedures

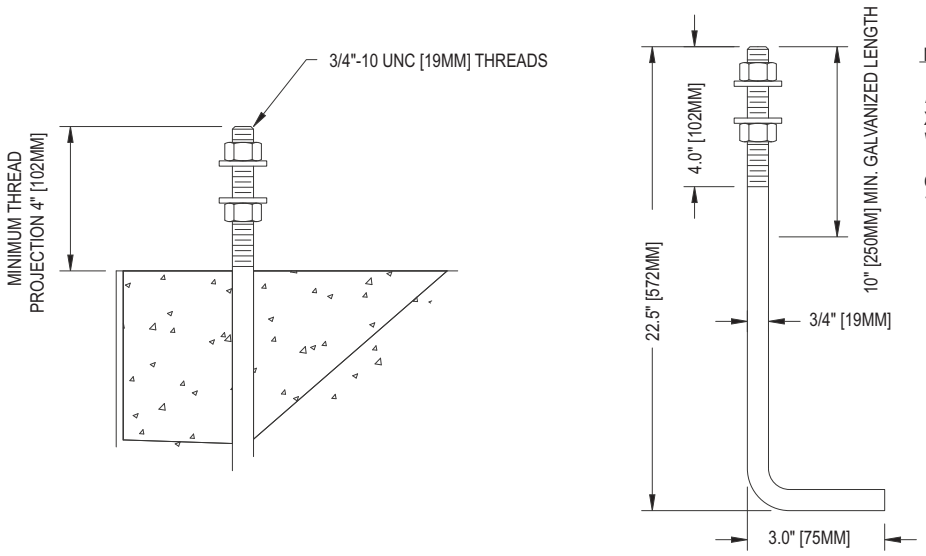
1. Review Figure 13. Verify that all material has been received in accordance with the windsock tower version being installed.
2. Provide a concrete base as instructed by the Engineer to suit local site conditions. Alternately, a Chance type ground anchor can be used if suitable for local conditions. Contact ADB for further information.

Figure 1: Base Diagram



3. Refer to drawing (Figure 2) for standard anchor bolt layout and setting procedures. Refer to drawing (Figure 3) for frangible anchor bolt layout and setting procedures.

Figure 2: Standard Anchor Bolt Detail



NOTES:

ANCHORBOLTS ARE SUPPLIED WITH 2 X A235 HEAVY HEX NUTS AND FLAT WASHERS, GALVANIZED.

GALVANIZED FINISH SHALL CONFORM TO CSA G164-M92.

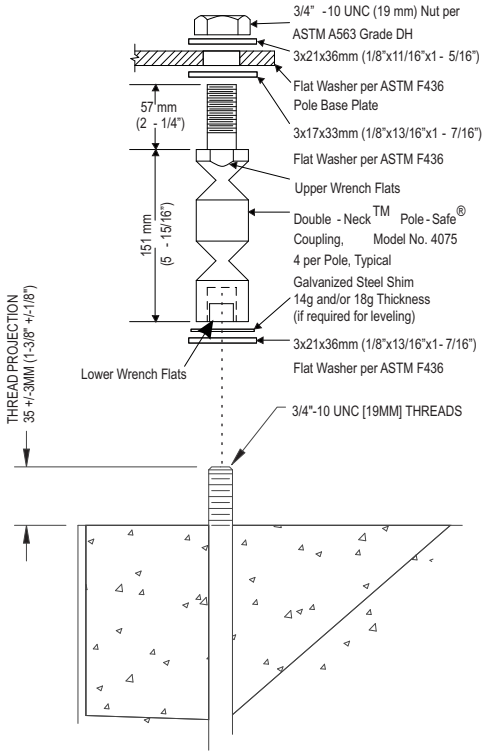
Additional Notes:

Tower concrete base depth and reinforcement to be determined by a qualified engineer and based on local soil conditions.

Alternate mounting methods are available - please contact ADB

For frangible mounting configuration, please refer to Figure 3.

Figure 3: Frangible Anchor Bolt Detail



INSTALLATION INSTRUCTIONS

NOTE: Proper Installation is essential for the Pole-Safe Breakaway Support System to function correctly as designed.

1. Surface of foundation around anchor bolts must be smooth, flat and free of debris.

2. Existing anchor bolts MUST be sized to the proper projection height as shown on the reverse side of these instructions. Then, anchor bolts shall be cleaned, and if necessary, coated with cold galvanizing material prior to installing Pole-Safe couplings.

3. Install lower flat washers, and thread Pole -Safe couplings on to anchor bolts.

4. If needed, shims are provided for leveling of the pole base plate, and may be installed on the top and/or bottom of the couplings. No more than 2 shims shall be installed on any one coupling. For larger adjustments that may be required, install no more than one additional flat washer per Pole-Safe coupling.

5. Use lower wrench flats to tighten Pole-Safe couplings on to the anchor bolts. Secure couplings as tight as possible using conventional wrenches. Do not use a pipe wrench. Couplings must be seated squarely on the washers, and washers must be seated uniformly on top of the foundation. If necessary, remove coupling and reduce the anchor bolt projection height to allow proper seating of the couplings.

6. Install a flat washer on top of each Pole-Safe coupling, and set the pole with base plate on top of the couplings.

7. Install a flat washer and nut on to each Pole-Safe coupling extended through the pole base plate. If pole is not plumb, install shims and/or washers for proper leveling as described in Step 4 above.

8. Tighten each nut on to pole base plate. Pole-Safe couplings must be held with an additional wrench on the upper wrench flats to prevent an induced torque stress across the necked portion of the couplings. Nuts shall be tightened using the turnofnut method in accordance with American Institute of Steel Construction (AISC) procedures (for ASTM A325 and A490 anchor bolts, 1/3 rotation past " snug tight ").

4. Ensure that anchor bolts are set vertical and that the bottom nuts and washers on which the windsock tower base will sit are level in both planes.
5. Install base section onto four anchor bolts using 3/4" washers and nuts. Tighten nuts, ensuring that tower base section is plumb in both directions.
6. Locate pole section between uprights of base section. Lubricate pivot points on base and pole with an appropriate waterproof grease, align holes and insert 1" stainless steel pivot bolt with one flat washer through holes. Install flatwasher, lockwasher and nut on opposite side. Tighten snugly but do not over tighten, ensuring that the pole pivots smoothly with no interference or binding.

7. If not already installed in the tower pole section, Using a fishtape, pull black and white 14 ga. wires through threaded hole in side of pole section through to hole in top of the pole section. Leave approximately 12" of wire extending through the top, and balance remaining out the side. Install 90 deg. liquid tight conduit fitting, conduit, and straight fitting, feeding wire through. Install weatherproof FS box on side of tower base (where used) providing enough slack in conduit to allow for pivoting of the tower.
8. If Quartz 6.6A Series powered option (-H) is used, drill and tap suitable mounting holes for the constant brightness transformer enclosure and fasten to base section below toggle switch. Interconnect the transformer and the switch using two conductor, 12 or 14 ga. SOW type cable or liquid tight conduit and wiring with the appropriate fittings. Install SOW cable complete with male FAA type connector and connect to secondary lead of 200W isolating transformer.
9. For the LED 6.6A Series powered option (-LC), installation is the same as 8. above except no separate weather proof switch is used. The liquid tight conduit is run directly to the LED Power Supply. The LED power supply enclosure is the same size as the constant brightness transformer enclosure. An integral switch is used with this power supply.
10. For the LED voltage powered option (-LV), installation is the same as per 8. above except no constant brightness transformer is used. The incoming power feed is connected directly to the bottom of the weatherproof switch.
11. With the pole section pivoted to the horizontal position and supported by a sawhorse or other suitable method, install the threaded rod, washers and nuts as shown on drawing SAT891119-1. The wing nut will be used to secure the pole in the vertical position.
12. At the top end of the pole, install the conduit nipple and C-fitting. Install the swivel assembly on top of the C-fitting being sure to feed the wires from the swivel into the fitting. Connect the wires from the swivel to the wires from the pole using wire nuts. Tape connections to ensure that they are secure.

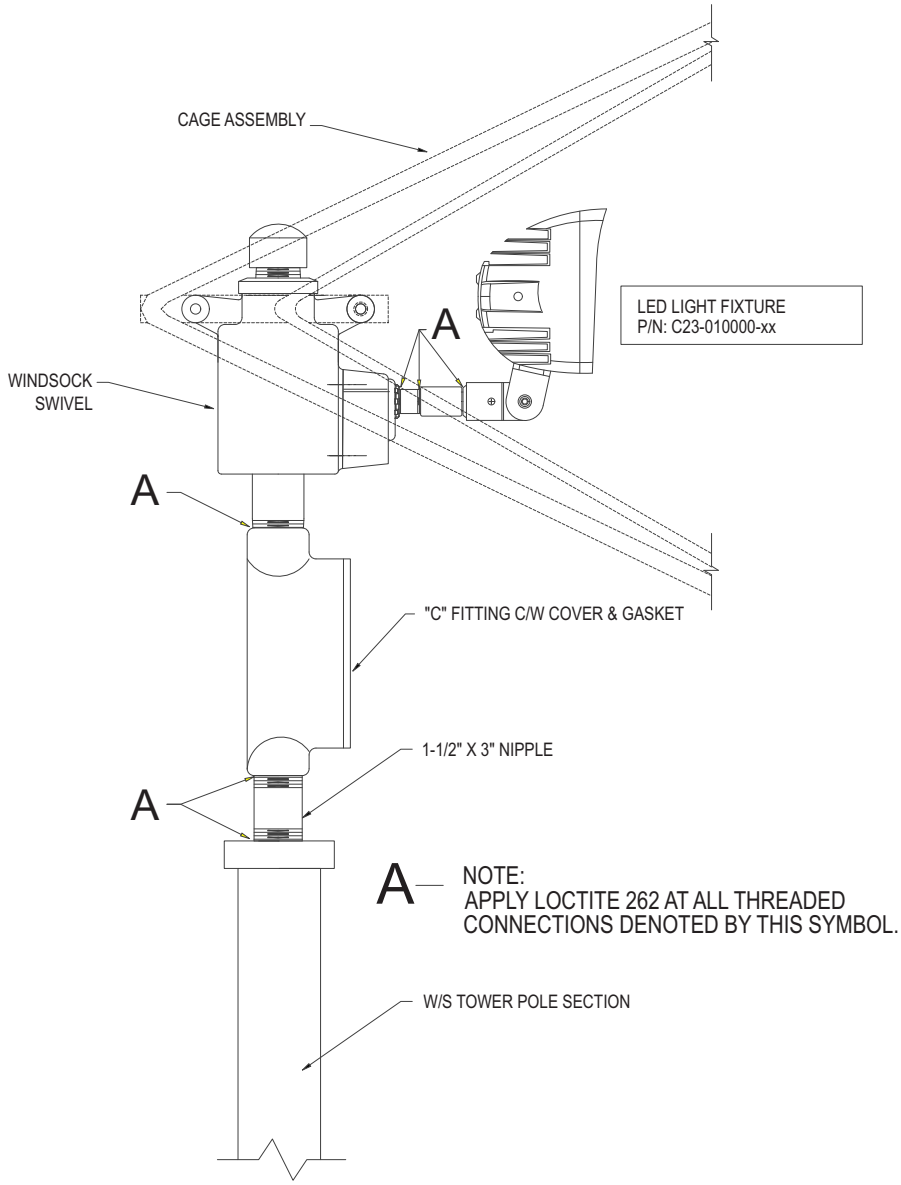
CAUTION

The LED Current Powered Option (-LC) wiring is +/- polarity sensitive. Reversing the polarity may cause damage to the LED fixture not covered by warranty. It is always recommended that the continuity/polarity of the wiring be confirmed prior to connecting the fixture.

Failure to observe this caution may result in equipment damage.

13. Refer to the appropriate wiring diagram included at the back of the manual and make the connections as required.
14. All threaded connections at top of pole including conduit nipple, C-fitting and swivel threads must have threadlocking compound applied to prevent loosening of connections and possible damaged to threaded surfaces. ADB suggests using a Loctite #262 or equivalent threadlocking compound prior to assembly of the threads. Ensure all threaded connections are tight prior to putting unit into service. Refer to Figure 4 for details.

Figure 4: Thread Locking Compound Application



15. Remove the four socket head bolts from the cover on the swivel and screw the appropriate fixture into the cover. Connect the wires from the fixture to the wires in the swivel using wire nuts and taping the connections for extra security. Reinstall the cover on the swivel and ensure alignment of fixture is in accordance with the drawings. Ensure to follow correct polarity for the fixtures in accordance with the wiring diagrams.
16. Attach the cage assembly to the swivel with the 3/8" dia. bolts, washers and nuts provided. Verify that the unit will swivel smoothly with no binding. Attach the fabric windsock to the cage by lacing or wire ties.

    NOTE: Ensure that the two brass drain grommets in the windsock will be located at the bottom of the windsock when the tower is raised. This will prevent accumulation of water in the sock.
17. If used, install appropriate lamp in fixture and test unit to ensure that it is functioning properly.
18. Raise unit to the vertical position and secure to base with wing nut. Fill counterweight with sand to level where unit can be lowered easily by one person. Secure cover to counterweight using screws provided.

2.4 Commissioning

2.4.1 Constant Brightness Transformer Adjustment

ADB quartz internally illuminated windsock towers are designed to be used on a variable brightness runway or taxiway circuit series (5-step or 3-step) and are equipped with a constant brightness transformer that will maintain the illumination level of the windsock tower as the circuit brightness level is decreased to the lower intensities. Prior to continued operation of the windsock tower it is necessary to adjust this constant brightness transformer to obtain the correct lamp current levels.

Failure to correctly adjust the constant brightness transformer will result in improper illumination levels and/or greatly reduced lamp life.

Note that the transformer tap settings are unique for each different series circuit and each type of CCR. Each windsock tower must be checked upon installation.

2.4.1.1 Description

The constant brightness transformer is used to provide a cost effective method of maintaining lamp illumination levels through the various series circuit intensity levels. It works on a saturation principal which provides the lamps with an operating current in the range from 5.8 to 6.5A as the series circuit varies from 2.8 to 6.6A.

2.4.1.2 Equipment Required

The following equipment is required or recommended for adjusting the constant brightness transformer:

1. Wire Strippers/Cutters
2. Flat Head Screwdriver
3. True RMS Clamp-on Ammeter (0-10A) (Fluke Model 31 or equiv.)
4. True RMS Voltmeter 0-200VAC.

   NOTE: TRUE RMS Meters must be used for this adjustment as the output current and voltage waveforms from a Constant Current Regulator are not a true sine wave. Use of standard meters may give readings that are lower than the actual values resulting in incorrect settings and reduced lamp life.

2.4.1.3 Procedure

1. Confirm that the correct isolating transformer size is installed (200W).
2. Turn-off the weatherproof switch controlling the power to the lamp.
3. Gain access to the interior of the windsock tower constant brightness transformer housing by opening the cover of the enclosure. Make initial wiring connections to the terminal block in accordance with Figure 5 and Figure 6.
4. Locate one of the wires going from the brightness transformer to the lamp and clamp the ammeter on this wire.
5. Re-connect the windsock tower to the circuit and set the intensity of the series circuit to the highest level (B100 or B5) which is 6.6A.
6. Using a True RMS voltmeter, refer to Figure 5 then Figure 6 and measure across the designated lamp taps to check for 12 - 15VAC when using a 100W lamp. (If using a 150W lamp, search for 18-22VAC and if using a 200W lamp, search for 26 to 30VAC.) If unable to locate the appropriate voltage, change the input taps to the constant brightness transformer in accordance with the drawing and re-check.
7. Once the correct voltage is located, connect the wires leading to the lamp to these terminals.
8. With the clamp-on ammeter on one of the wires leading to the lamp, turn on the switch and check the lamp current. The current should be in the range of 5.5 to 6.5A. If above or below this range, re-adjust transformer taps in accordance with the drawing and re-check.
9. Once the current/voltage level has been correctly set, disconnect the ammeter and reconnect the leads. Close the cover on the enclosure ensuring a tight seal. Confirm that the incoming power cable is securely connected to the transformer secondary lead.

Figure 5: Constant Brightness Transformer Schematic

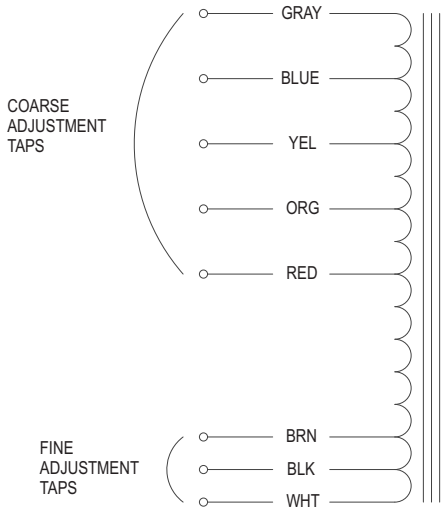
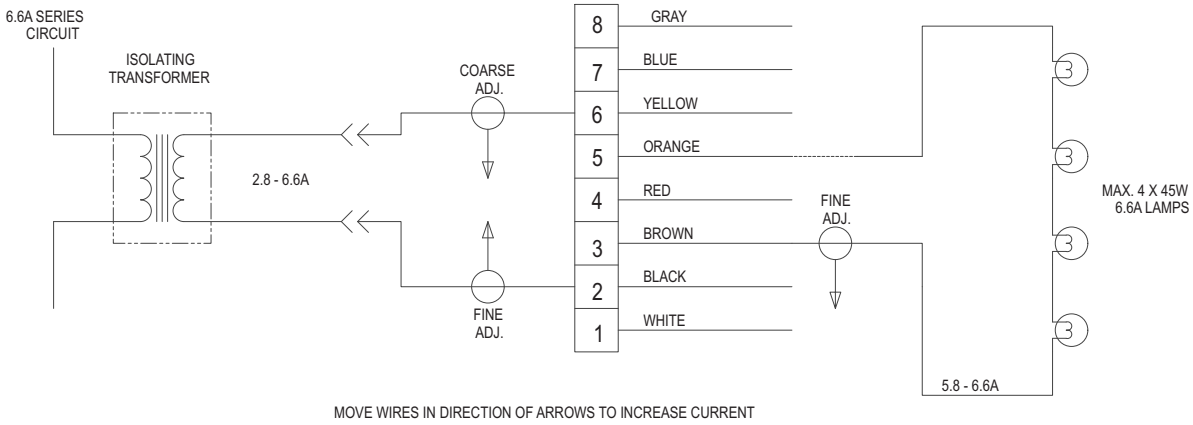


Figure 6: Constant Brightness Transformer Connections



2.4.2 LED Current Power Supply Adjustment

ADB LED internally illuminated windsock towers are designed to be used on a variable brightness runway or taxiway circuit series (5-step or 3-step) and are equipped with a constant brightness output power supply that will maintain the illumination level of the LED windsock tower fixture as the circuit brightness level is decreased to the lower intensities.

There are no adjustments required for the LED fixture power supply. Open the power supply enclosure and referring to Figure 7, ensure that the P1 jumper is removed from all pins on the power supply PCB.

2.4.3 LED Voltage Fixture Adjustment

There are no adjustments on the voltage powered LED version. Simply connect the windsock tower to a source of 120-277VAC as per wiring diagram Figure 12.

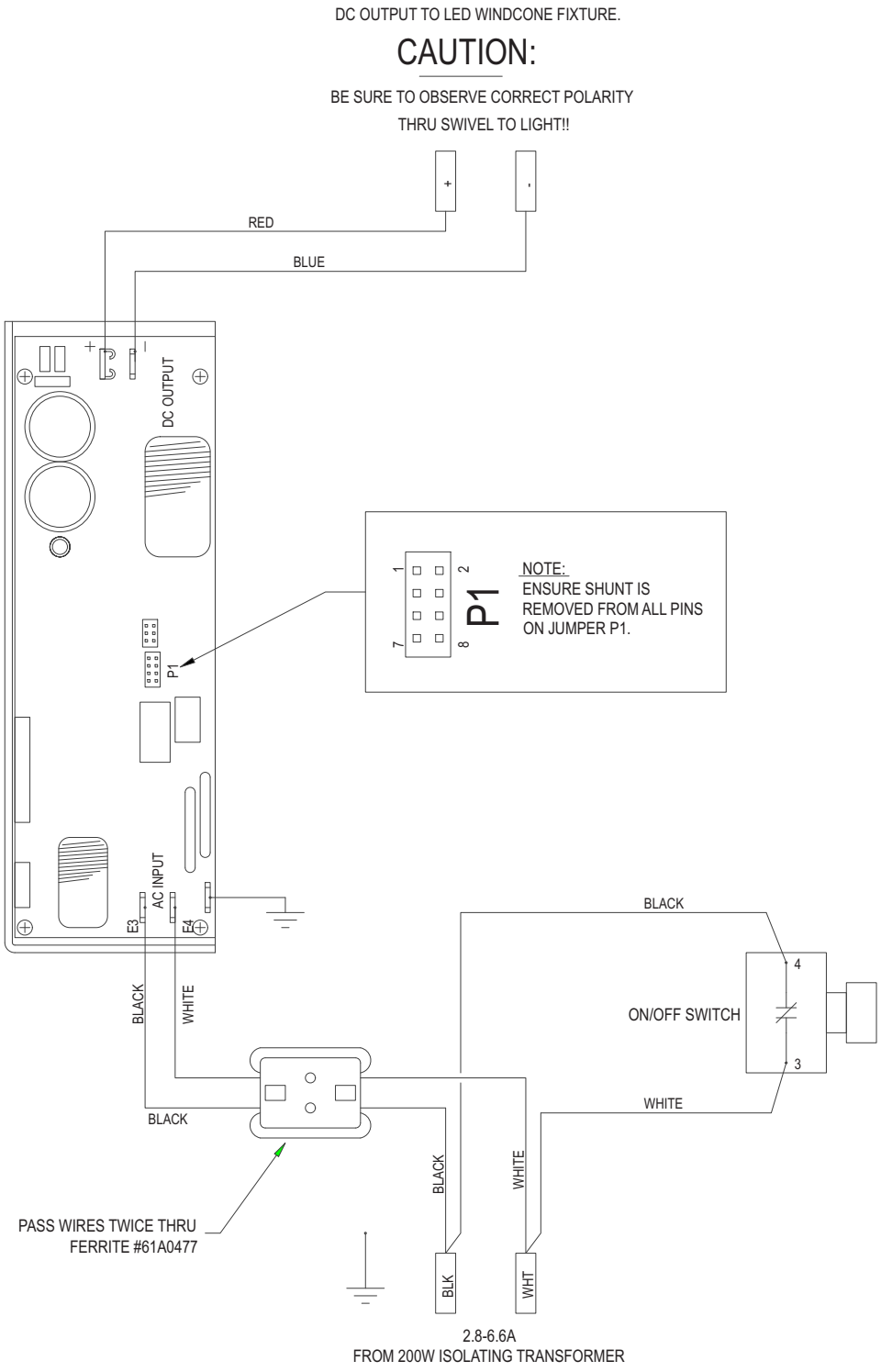
2.5 Operation

The operation of the windsock tower is straight forward. The internal light unit energizes when power is supplied to the unit and the disconnect switch is turned on.

2.5.1 LED Current Power Supply

LED current power supply PCB has an indicator diode on the PCB. A normal operating power supply will flash the PCB LED D4 at a 2 second rate when power is first applied. If the power supply senses current flowing to the LEDs the PCB LED D4 will continue to flash at a 2 second rate. If the power supply senses an open circuit on its output after about 5 seconds, it will turn off the PCB LED D4.

Figure 7: LED Windcone Fixture



2.6 Maintenance

2.6.1 Periodic Maintenance Schedule

Perform maintenance based on frequency as established by airport policies and procedures recommended by Transport Canada.

Table 1: Recommended Minimum Maintenance Schedule Table

MAINTENANCE REQUIREMENT	D	W	M	BM	SA	A	U
1. Inspect for outages; repair as necessary	X						
2. Check light fixture alignment and orientation			X				
3. Clean fixture & check for moisture in light				X			
4. Lubricate pivot bolt and wingnut with a suitable waterproof lithium based grease.					X		
5. Check all fasteners for proper tightness.					X		
6. Inspect structure for any cracks, corrosion etc. and replace where required. Touch up any bare metal areas to prevent corrosion and maintain high visibility.					X		
7. Check input power to ensure voltage/current is within specifications.						X	
8. Inspect and replace any cracked or frayed wiring.						X	
9. Replace windsock if torn or faded.							X
10. Check swivel bearings for smoothness and ease of rotation.						X	
10. Inspect swivel brushes for wear.						X	
10. Replace lamps after 80 percent of the rated life and prior to 90 percent of the rated life.							X
D = Daily, W = Weekly, M = Monthly, BM = Bi-monthly, SA = Semi-Annual, A = Annual, U = Unscheduled							

2.6.2 Swivel Maintenance

The windsock swivels are equipped with permanently lubricated bearings that require no maintenance. The brushes are field replaceable and can obtained by contacting ADB. It is recommended that for any further repair required on the swivel unit that it be returned to ADB for refurbishment.

2.7 Troubleshooting

Refer to the following troubleshooting guide table specific to your model:

Table 2: LED Current Powered (-LC)

Problem – LED Current Powered	Possible Cause	Corrective Action
Light fixture is out	Loose wires or connections	Tighten or replace wires.
	No current or incorrect current coming into the power supply	Verify correct current is coming into the power supply using a true RMS ammeter. This would be 2.8 A to 6.6 A for a 5-step CCR; 4.8 A to 6.6 A for a 3-step CCR. Check the isolating transformer wattage rating, it should be 200W.
	Power supply ON/OFF switch is closed	Check the power supply ON/OFF switch for proper operation. Replace if necessary.
	Power Supply fault	With field current on, on power supply PCB 44A7260/010, measure the voltage at test point E7 with respect to E8. E7 will be 10 VDC to 13 VDC on a properly operating power supply when powered. Check to insure that the jumper on the power supply is set properly. The jumper at P1 should be removed at not across any terminals. See Figure 7. Next, the power supply can be checked for operation by performing the following: Remove input power, disconnect the output LED load at E6 and E5. Connect a DC volt meter from E8 to E5. Look for a rising voltage to approximately 195 VDC within the first few seconds of powering on the board. This voltage will then drop to less than 50 VDC and the onboard LED (D4) will flash within a few seconds. If the voltage was between 50-195 VDC during the first few seconds of applying power, then the power supply is likely good. Note: the voltage at E8-E5 will cycle again about 40 seconds after dropping to less than 50 VDC and repeat five times and will stabilize. The input power must be cycled off for about 1 minute to get the output to cycle on again. Follow the correct polarity when reconnecting the LED fixture wiring.
Light fixture is out.	Incorrect polarity in wiring.	Refer to Figure 11 and confirm that windsock tower and swivel are wired such that polarity is maintained. Confirm continuity of each leg.
	Defective/worn swivel brushes.	Examine swivel brushes to confirm proper contact with slip-rings on swivel shaft. Check brushes for wear and replace as necessary.

Table 3: LED Voltage Powered (-LV)

Problem – LED Voltage Powered	Possible Cause	Corrective Action
Light Fixture is out.	Loose wires or connections	Tighten or replace wires.
	Switch is defective or in OFF position	Ensure that the switch is ON position. Check for voltage on both terminals of switch. Replace if necessary
	Defective LEDs or driver unit in fixture.	Replace fixture with correct voltage powered unit.
	Swivel brushes are worn.	Examine and replace brushes and carrier as necessary.

Table 4: Quartz Current Powered (-H)

Problem – Qtz Current Powered	Possible Cause	Corrective Action
Light Fixture is out.	Loose wires or connections	Tighten or replace wires.
	Switch is defective or in OFF position	Ensure that the switch is ON position. Check for voltage on both terminals of switch. Replace if necessary.
	Lamp is burned out	Replace lamp.
	Swivel brushes are worn.	Examine and replace brushes and carrier as necessary.
Short lamp life.	Incorrectly set constant brightness transformer.	Refer to section 2.4.1 and adjust current/voltage as required.

2.8 Wiring Diagrams

Wiring diagrams can be found at the end of the manual.

2.8.1 General Wiring

General wiring information can be found on drawing 891119A. Figure 8 - Figure 10.

Figure 8: 2.8-6.6A Series Circuit - LED (Class 3) Wiring Diagram

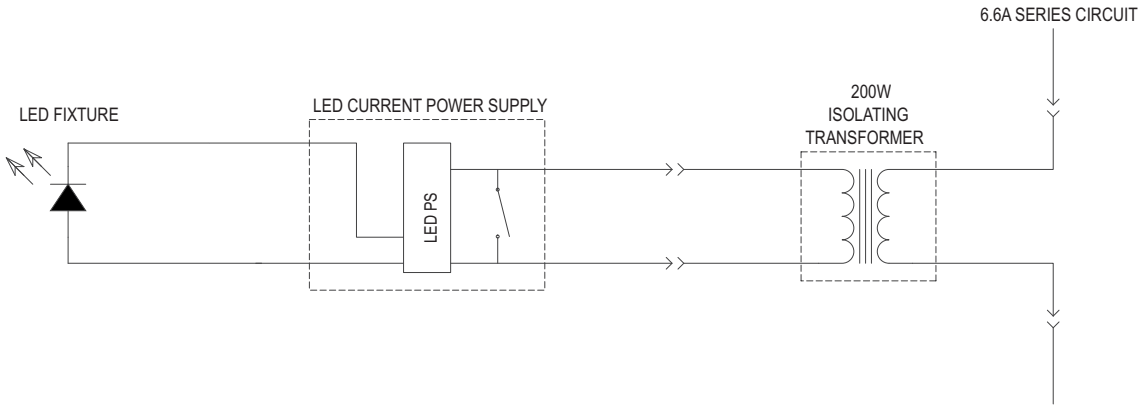


Figure 9: 2.8-6.6A Series Circuit - Quartz (Class 3) Wiring Diagram

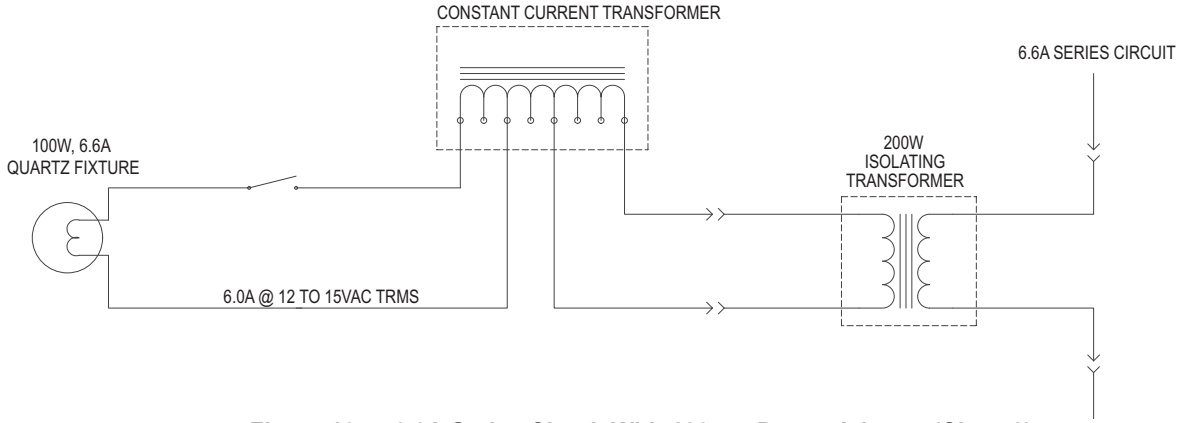
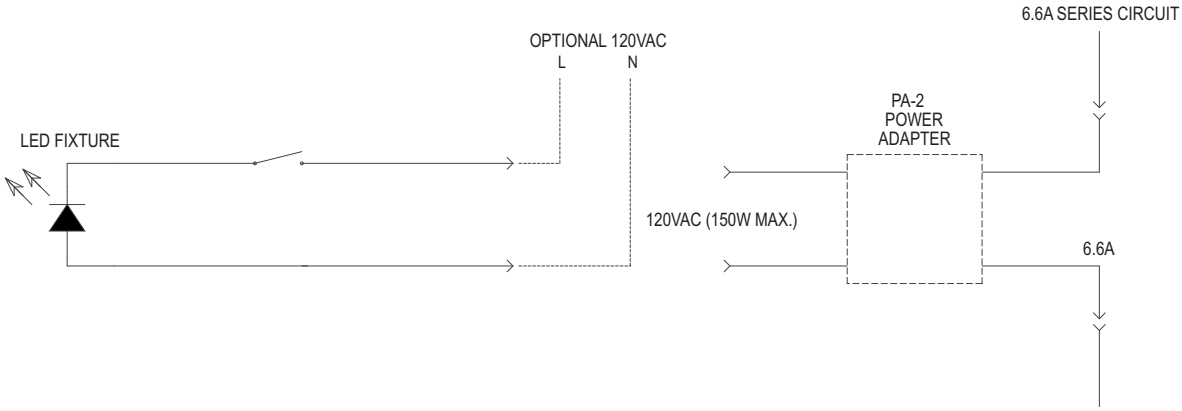


Figure 10: 6.6A Series Circuit With 120vac Power Adapter (Class 2) or 120Vac (Class 1) Wiring Diagram (LED/Quartz)



2.8.2 Current Powered Quartz Version (-H)

Quartz current powered version should be wired in accordance with Figure 5 - Figure 6.

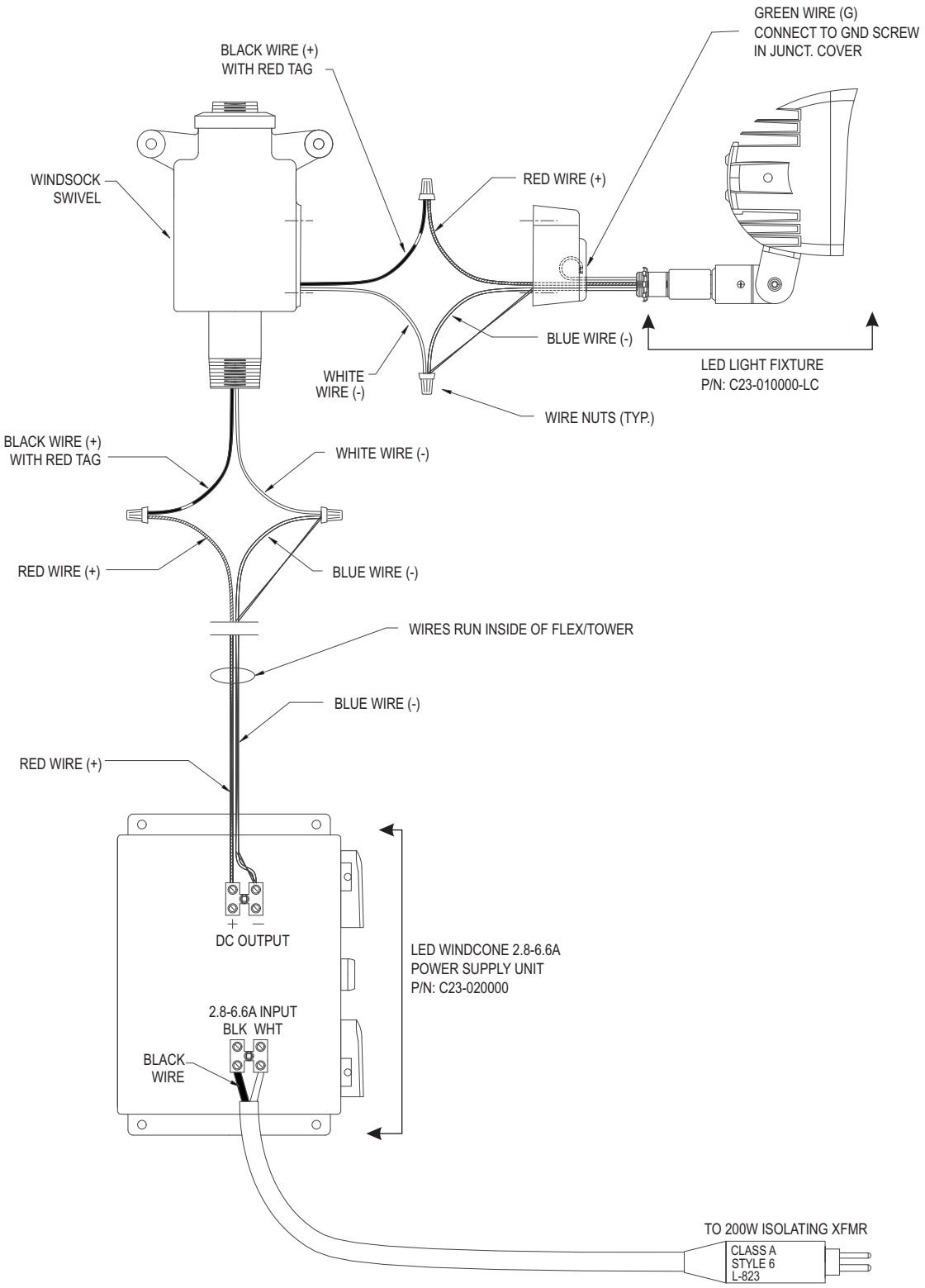
If unable to achieve the correct current level, the lamp side tap on the orange wire may be moved to the red or yellow taps as required.

In order to achieve the correct current setting a common tap for one input and output may be required.

2.8.3 Current Powered LED Version (-LC)

LED current powered version should be wired in accordance with Figure 11.

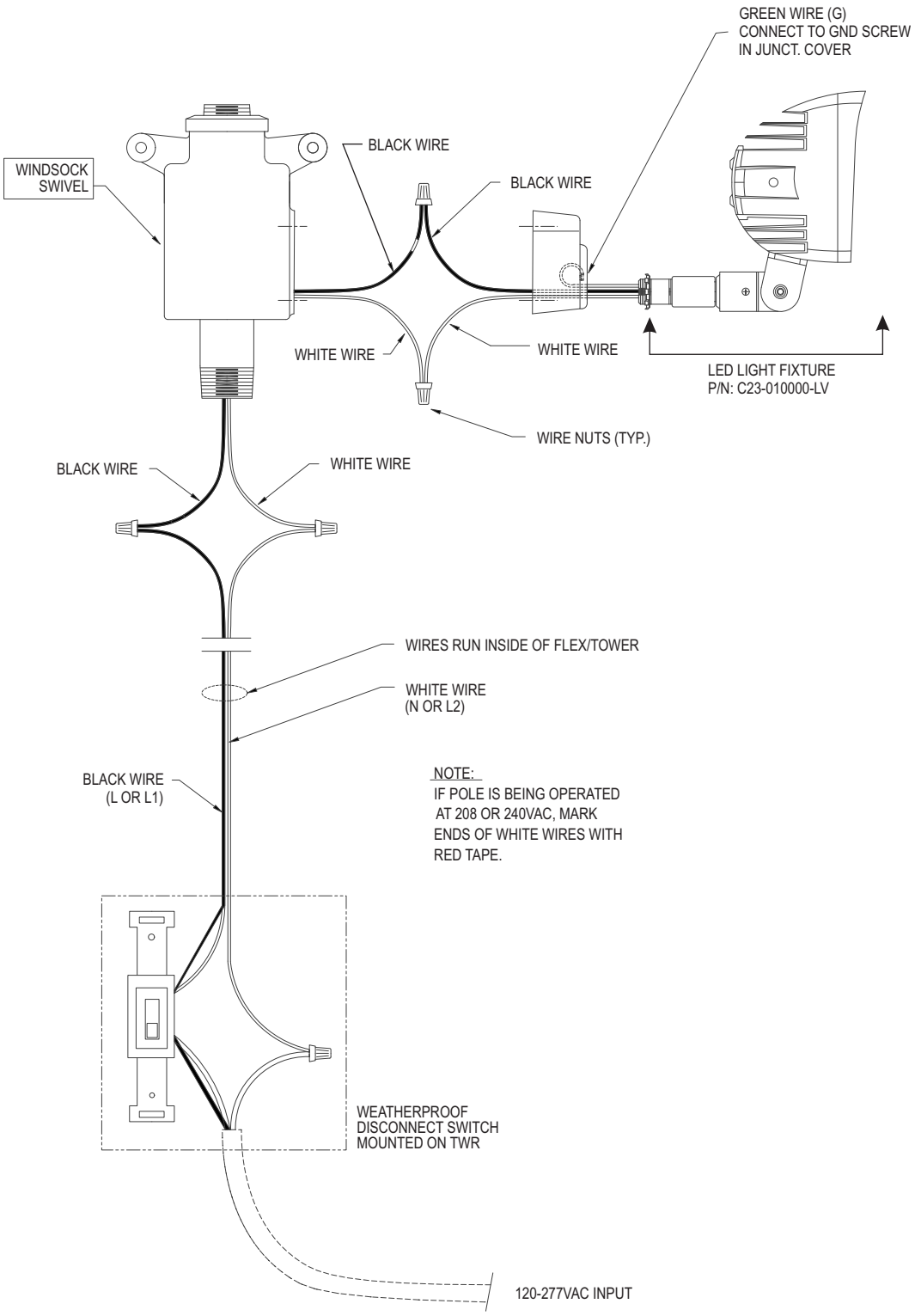
Figure 11: LED Windsock Tower 2.8-6.6 A (-LC)



2.8.4 Voltage Powered LED Version (-LV)

LED voltage powered version should be wired in accordance with Figure 12.

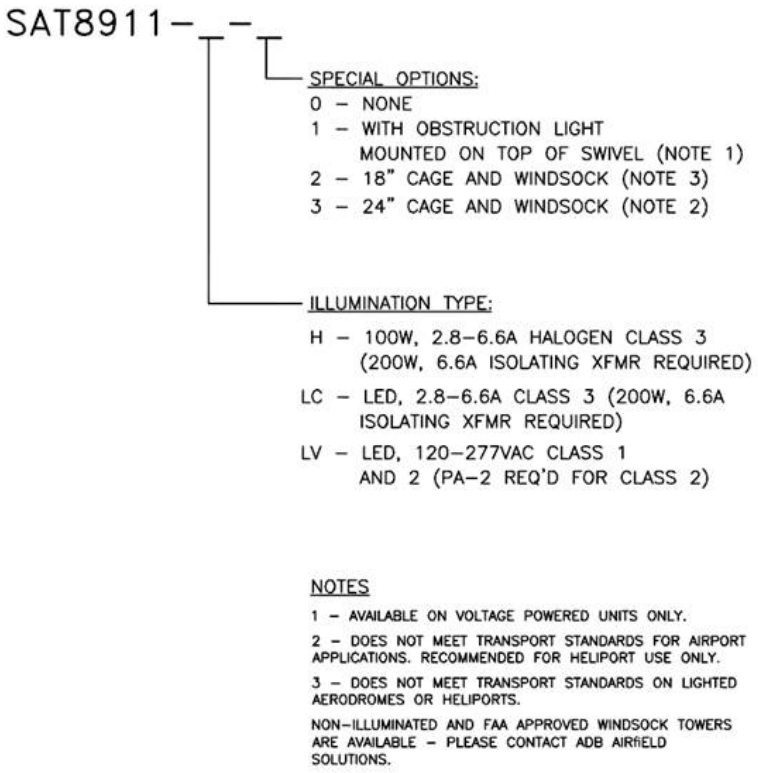
Figure 12: LED windsock tower 120 vac (-LV) Wiring Diagram



3.0 Parts

The parts section is a separate file in the book so that it can be used in the Parts manual.

3.1 Order Codes



3.2 Parts Diagram

Refer to drawings 891119-1 and 891119-7 for the parts listing and bill of material details. See Figure 13.

Figure 13: TC Windsock Tower Type SAT8911-X

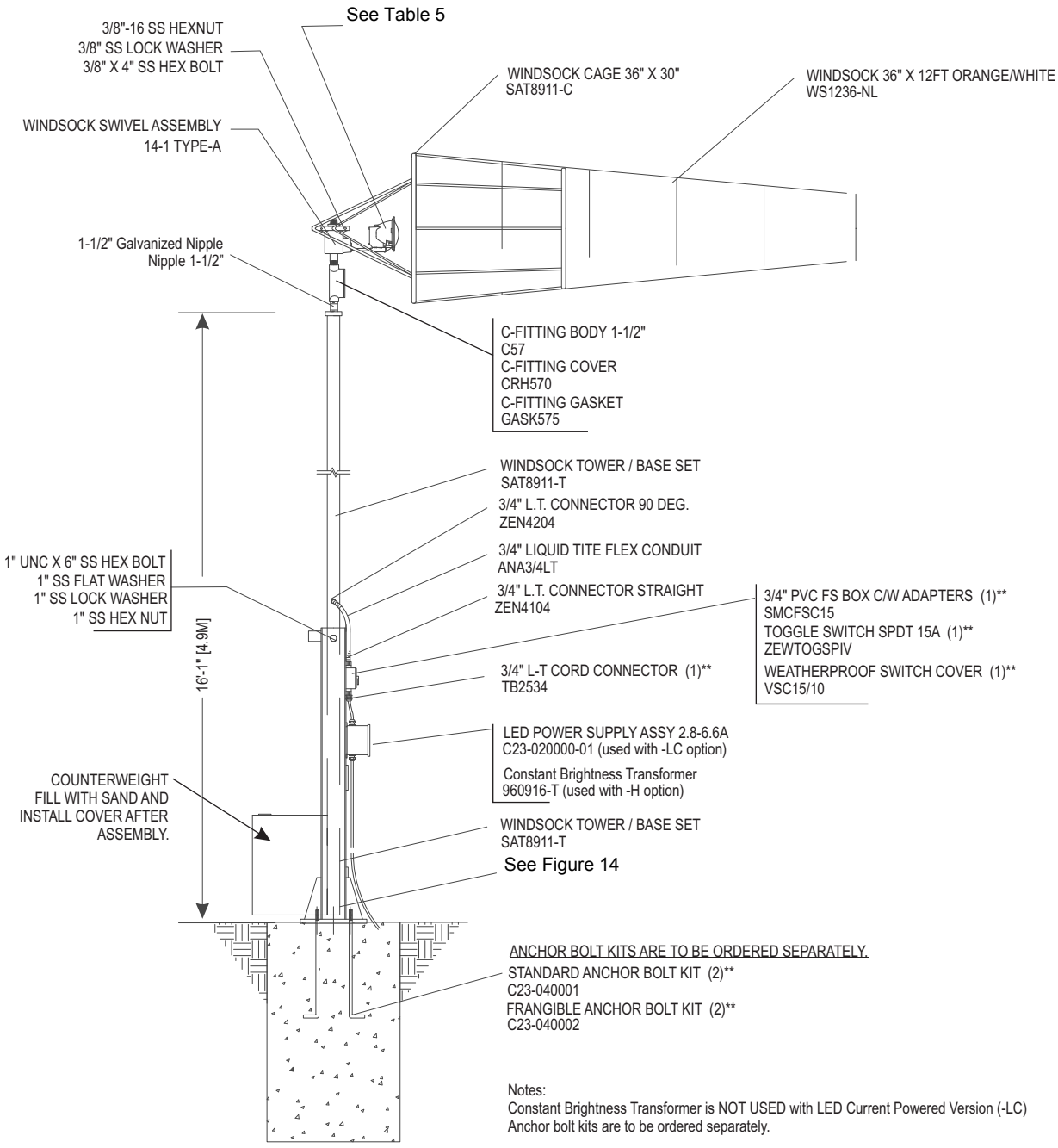


Figure 14: Pole Stop Detail

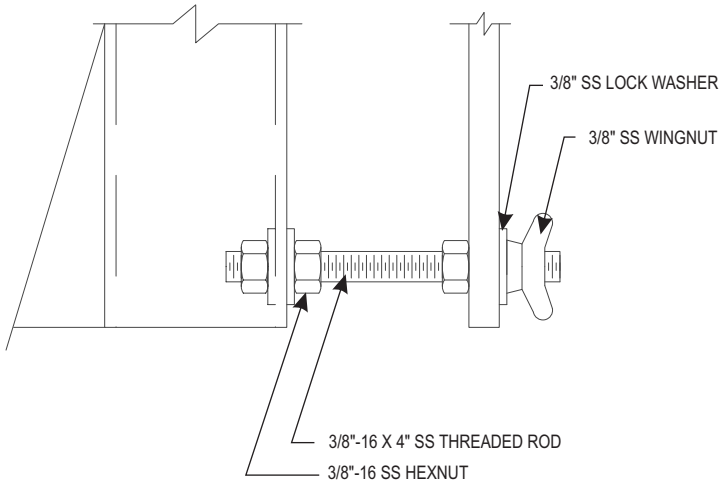


Table 5: Lamp Assembly Part Options

Description	Part Number
for LED 120-277 vac Powered Light	
LED Fixture, Voltage Powered 120 - 277 vac	C23-010000-LV
for 100 W, 2.8 - 6.6 A Halogen Lamp	
Approach LGT Fixture Modified	FAE-1-WS
Lamp 100W, 6.6A, PK30D	64342
Constant Bright. Transformer C/W Encl. for W/S	960916-T
for LED Current Powered 2.8 - 6.6 A Light	
LED Fixture Assy For Series Current Power	C23-010000-LC
LED Power Supply Assy 2.8-6.6A	C23-020000-01

3.3 Spare Parts

Table 6: Spare Parts Table

Description	Part No.
Windsock, 36" x 12 ft Orange/White	WS1236-NL
Windsock, 36" x 12 ft Solid Orange	WS1236S
Windsock, 24" x 8 ft Orange/White	WS0824
Windsock, 24" x 8 ft Solid Orange	WS0824S
Windsock, 18" x 6 ft Orange /White	WS0618
Windsock, 18" x 6 ft Solid Orange	WS0618S
Cage Assembly, 36" diameter	SAT8911-C
Cage Assembly, 24" diameter	SAT8911-C24
Cage Assembly, 18" diameter	SAT8911-C18
Swivel Assembly, Lighted	14-1 TYPE-A
Replacement Brush & Carrier Set	18-11A
"LC" Option:	
Light Fixture Assembly LED, 2.8-6.6A	C23-010000-LC
Replacement LED Power Supply	44A7260/010
"H" Option:	
Light Fixture Assembly Qtz 100W, 2.8-6.6A	FAE-1-WS
Lamp, Qtz 100W PK30d, 6.6A	64342
Constant Brightness Transformer	35A0340/CSA
"LV" Option:	
Light Fixture Assembly LED, 120-277VAC	C23-010000-LV

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